

UNITED STATES PATENT OFFICE.

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BRAKING APPARATUS.

1,249,143.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MALCOLM LOUGHEAD, a citizen of the United States, and resident of Santa Barbara, in the county of Santa Barbara and State of California, have invented new and useful Improvements in Braking Apparatus, of which the following is a specification.

This invention relates to braking apparatus for automobiles and the like, and more particularly to a braking system for automobiles which comprises means for applying braking force to brakes on the wheels through the medium of a fluid instead of through the medium of a train of mechanical links and levers.

The braking systems in common use on automobiles involve a solid rod connecting the braking system with the mechanism at the driver's seat for applying force to the brakes. Owing to the movement of the chassis with relation to the brakes on the wheels there is a continual change in the relationship between the brakes and the means for applying force thereto through the medium of the connecting rod. This involves a change in the adjustment of the brakes as the chassis moves with relation to the wheels due to relative movement of the parts, and also due to variation in the normal position of the chassis with relation to the wheels resulting from changes in the load upon the chassis.

The principal object of my invention is to provide improved means for operating the brakes which is unaffected by changes in the position of the chassis with relation to the brakes. To this end I provide means responsive to fluid under pressure for operating the brakes, means for transmitting fluid under pressure to the responsive means, and means at the driver's position to control the supply of the fluid under pressure to the responsive means.

Further objects of my invention are to provide means for braking the front wheels of an automobile as well as the rear wheels; for producing braking forces at the respective wheels which are substantially equal to each other at all times, thereby to reduce the liability of skidding to a minimum; for transmitting the braking power to the front wheels without interfering with the steering of the wheels; for distributing the braking power evenly to the front wheels when the car is steered in any direction; for

producing a greater braking force at the wheels without increasing the range of movement of the foot pedal or other operating means at the driver's position; etc.

Other objects attained by my invention will be apparent from the following description taken in connection with the accompanying drawings, in which

Figure 1 is a skeleton view of my braking system applied to an automobile;

Fig. 2 is a vertical longitudinal section of means for supplying fluid under pressure to the brakes, parts being shown in elevation;

Fig. 3 is a detailed view showing the brake mechanism applied to a front wheel, the wheel being shown as detached from the axle bar, parts of the wheel being broken away and parts being shown in section; and

Fig. 4 is a detailed elevation of a portion of a front wheel such as illustrated in Fig. 3, the spokes of the wheel being omitted, the connection between the steering knuckle and the axle bar being illustrated, and parts being shown in section.

The particular embodiment of my invention herein disclosed comprises fluid operated brakes 1, mounted at the inside of each of the front wheels, and similar fluid operated brakes 2 mounted at the inside of the rear wheels. The means for supplying fluid under pressure to these brakes comprises plunger mechanism 3, which is preferably foot controlled and which is mounted at the driver's position, and individual pipes 4 connecting the plunger means with each of the brakes at the respective wheels. Any suitable type of conduit may be employed for connecting the plunger means with the brakes but I prefer to employ rigid pipes rigidly mounted upon the chassis, these pipes terminating at the respective wheels in flexible portions 5 to provide for the relative movement of the wheels and chassis.

The plunger mechanism illustrated in detail in Fig. 2 comprises a casing 6 suitably mounted on the chassis, and a plunger 7 fitting smoothly within the casing 6. The upper end of the casing is threaded, and a stuffing box nut 8 is arranged to be threaded thereupon. A stuffing box gland 9 fits within the stuffing box nut and is adapted to compress a suitable packing 10 so as to prevent leakage of the fluid from the casing 6. The casing is preferably mounted beneath the floor of the automobile so that the plunger 7 extends upwardly through the floor in a